

REMARKS

Applicants respectfully request reconsideration of the above-identified patent application pending claims 1-5, 8-10 and 23-28 in view of the Response to the Examiner's Response to Arguments, flowing remarks and evidence that is already of record herein, including, for example, the state of the art teaching away from the claimed invention provided previously-presented Aastrup Declaration. Claims 1-5, 8-10 and 23-28 are pending.

The Examiner's "Response to Arguments"

On pages 2-10 of the Office Action, the Examiner provides what can only be termed a "rant" about applicant's trying to efficiently prosecute this patent application by addressing the specific rejections and providing evidence of record. Specifically, applicants have continued to point out that a *prima facie* case of obviousness *of the claimed invention* has never been made because the Examiner is supposed to point out where in the prior art reference a specific disclosure or suggestion of each and every claim limitation is provided. Instead, the Examiner's is substituting his "scientific theory" a highly speculative musing about the situation that is substituted for evidence and actually contradicts the evidence that applicants have submitted from outside sources (such as the three contemporaneous references submitted with the Aastrup Declaration. Applicants are having to address the Examiner's tangential "rantings" that never has addressed the point of the present patent prosecution, a showing of *prima facie* obviousness made with actual prior art references.

The summary of the Examiner's "Response to Arguments" is best found in item #8 where the Examiner admits that the rejections are based upon his "scientific theory" and not on anything disclosed in the two prior art references cited and without consideration of the evidence provided by applicants in the form of data showing surprising results in the specification and evidence of teaching away from provided in the Aastrup Declaration. That admission by the Examiner is proof that no *prima facie* showing of obviousness has been made because the Examiner admits that he has to rely on his speculative "scientific theory" rather than required disclosures in an actual prior art reference. In the course of exploring the Examiner's Response to Arguments, it is clear that the Examiner will not consider any evidence contrary to his "scientific theory." Therefore, applicants are now subject to an ever-evolving "scientific theory" has been elevated to fact and the prior conclusions are now fact, according to the Examiner. Moreover, there is no date associated with this "scientific theory" because, prior to it being expounded upon in each successive Office Action, it has no publication date that could consider this "scientific theory" to be prior art. There is even a section (item #7) where the Examiner has created a new standard for case law applicability but does not apply that newly created standard to any Examiner citations. In summary, the Response to Argument section needs to be reviewed by PTO management and

appropriate action taken so that applicants for patents at the PTO can have patent claims reviewed according to the Statute, Rule and MPEP and not a made up “scientific theory.”

Therefore, applicants shall point out the lack of relevance of the nine page Response to Arguments¹.

2. Item 2 begins on page 2 of the Office Action and goes to most of page 3. The Examiner has based this section an assumption. The Examiner summarizes this assumption by alleging (incorrectly) that “this limitation [addition of the term “continuous”] has overcome the Prior Art of record, in particular the Thompson et al. reference.” The Examiner has created yet another straw man. In the prior Amendment D (the response just prior to the present response), applicants did not argue that the amendment adding the explanation “continuous” was made to overcome Thompson et al. or the other Section 103 rejection in view of Josse et al. That argument is nowhere to be found. Therefore, the Examiner is now making up applicants’ arguments to respond to that which never existed before.

The Examiner also now tries to interpret the present claims to include electrodes with a donut shape. Why? Because the Examiner is trying to interpret claim language relating only to the key variable of surface area to include those shapes disclosed in Thompson et al. But as has been discussed *ad nauseum* in this file history, Thompson et al. discloses edge properties and the claimed invention contains a key surface area limitation (“**having a continuous surface area of less than 15 mm²**”) that even the Examiner admits is not disclosed or suggested in either Thompson et al. or Josse et al.

The Examiner also now creates new law with his run-on sentence (top of page 3 of the Office Action): “Furthermore, the instant specification fails to disclose that the newly added limitation of the first electrode having ‘continuous’ surface area is critical to the instant invention, or solves a particular stated problem, or serves a particular purpose, and as such, it appears from the Applicant’s own specification that any type of electrode having a total flat surface area will function equally as well.” This shows that the Examiner will fill in his own speculation and conclusions when the facts (what the specification, including the figures, teaches) do not support the conclusions. That appears to be the theme throughout this prosecution. The reality is that applicants have no idea what a donut shaped first electrode would or would not do. As noted by the Examiner, only continuous electrodes were made and the data (see, for example, the example on pages 17-18 and Figures 8-9 of the specification) shows the surprising results as a function of size comparing only continuous round electrodes differing only by surface area. Adding donut holes adds a new variable that makes the data not comparable.

¹ It should be noted that the Examiner’s “Response to Arguments” section is longer than the actual “arguments” applicant provided in the prior Amendment D. Perhaps the Examiner does protest too much?

In the last paragraph of this section, the Examiner will not give up with regard to Thompson et al. and now tries to interpret the term “continuous” as still having a donut hole. However, applicants have stated on the record that “continuous” means, well continuous, and not having holes in the surface. The Examiner’s existential arguments perhaps have a place in a philosophy course, but the Examiner later tries to claim that this patent application resides in a physics department. Moreover, the Examiner is in violation of MPEP §2141(II)(A) which provides “The scope of the claimed invention must be clearly determined by giving the claims the “broadest reasonable interpretation *consistent with the specification.*” See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316, 75 USPQ2d 1321, 1329 (Fed. Cir. 2005) and MPEP § 2111.” (emphasis added). *Phillips* provides that one looks first to intrinsic evidence within the specification, such as how applicants present electrodes, and not on some existential or metaphysical interpretation made up to try to prop up a failed rejection. Therefore, the Examiner’s rant with regard to the amendment in Amendment D is contrary to MPEP guidelines for obviousness.

3. In this section, the Examiner is trying to rebut applicant’s argument that the Examiner has not met the requirement for a *prima facie* case of obviousness. The Examiner alleges that applicant’s argument is unsupported verbiage. The Examiner claims that he provided a “scientific reasoned rejection.” And in those three words (“scientific reasoned rejection”), the Examiner has summarized why he has not met a *prima facie* case for obviousness. This is because the rejections are not based on prior art but instead of some “scientific theory” presented as a “scientific reasoned rejection.” Patent prosecution is not an academic or scientific debate in a university seminar room. Determining patentability in general, and determining whether or not a claimed invention is obvious over a single prior art reference, such as Thompson et al., is a matter of addressing each and every limitation in a claim that is presented. Patentability has to look at the claim limitations and determine if the prior art reference applied (singular in this situation) teaches or suggests each and every claim limitation. Scientific reasoning, whether it is in the philosophy department or the physics department, gets left back at the university. Applicants have not only “glossed over the Examiner’s scientific reasoned rejection” but applicants have addressed this rejection by pointing out the Examiner’s own admission that the key limitation (“*having a continuous surface area of less than 15 mm²*”) is, by the Examiner’s own admission, not disclosed or suggested in either prior art reference for either rejection.

The Examiner (in item #5 herein) cited *In re Kahn*, 441 F.3d 977,987 (Fed. Cir. 2005) for a motivational quote. Perhaps the Examiner should look to *Kahn* and MPEP §2142 for requiring something more than mere conclusions (“The Federal Circuit has stated that “rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of

obviousness.” *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).”). The only articulated statement by the Examiner is that Thompson et al. suggests “modification” of electrode size, not what the electrode size should be. This is an articulation of an obvious to try standard with no reasonable expectation of success. In fact not only is there no reasonable expectation of success, there is the opposite of a reasonable expectation of success, that is, a teaching away from quote in Thompson et al. that the Examiner cited in bold on page 4 of the Office Action.

The Examiner has asserted that Thompson et al. “suggests” that electrode size be “modified.” What does “modified” mean? Larger? Smaller? Drilling a hole in it? With hindsight, the Examiner answers the question as smaller. But Thompson et al., in the cited passage in bold on page 4 of the Office Action, points out that making the electrode smaller causes undesirable “instability in device resonance.” Yet the applicants in the first sentence of the “Description of the embodiments” section are specific (“The present invention is based on the surprising finding that a smaller sensing electrode area leads to a largely increased sensitivity of a piezoelectric resonator.”). How can the Examiner cite that passage and then come to a conclusion that Thompson et al. “suggests” the limitation (“**having a continuous surface area of less than 15 mm²**”) when it is known that such a limitation means a smaller electrode? Perhaps it is a question of philosophy and not physics after all². Applicants interpreted the quoted and bolded passage from Thompson et al. as teaching away from the key surface area limitation by suggesting the difficulty of making the electrode smaller.

After all, even the Examiner acknowledges “there is a tradeoff in stability and sensitivity when modifying the size (i.e. total surface area) and shape of the electrode, which does not negate one of ordinary skill in the art to indeed *modify* the electrode’s size and shape.” (emphasis added) It is that sentence and the following one, where the Examiner’s admits to the deficiency of the rejection. Stated otherwise, the Examiner admits that the Section 103 rejection over Thompson et al. is not supported by actual evidence in the form of a prior art reference. Specifically, the *claimed invention* is not dependent on whether one is motivated to “modify” the size of the electrode. In fact, modifying the electrode size, according to the suggestions in Thompson et al. cited by the Examiner would not make the electrode smaller³.

The Examiner concludes “one of ordinary skill in the art is well aware that modifying the surface area of the electrode is well within his/her skill set.” While in the abstract the conclusion is not one for argument, the claimed invention is not a process for modifying the surface area of an

² It should be noted that applicants do not agree with the Examiner’s conclusion that the invention is in the discipline of physics. It is actually an engineering issue.

³ Because Thompson et al. states: reducing the electrode size of one of the electrodes causes instability in device resonance.” Therefore, any modifications suggested by Thompson et al. would make the electrode size larger, not smaller. This is the basis for the argument that Thompson et al. teaches away from the claimed invention.

electrode. The claimed invention provides a key limitation regarding a smaller electrode, a direction of modification that Thompson et al. expressly teaches away from. Therefore, the Examiner again sets up a straw man to try to draw a conclusion that bears no resemblance to what is the claimed invention. Accordingly, the Examiner treats his conclusion as fact and will not allow any evidence submitted to alter an unsupported conclusion.

4. Applicants are at a loss to try to explain what the Examiner is trying to say in the first six sentences of this response to arguments section. It appears that the Examiner is now treating his unsupported conclusion as fact. Applicants indicated that no *prima facie* case for obviousness was made because the Examiner never met his burden of showing where each and every claim limitation was disclosed or suggested in Josse et al. The Examiner even admitted that the key limitation (“***having a continuous surface area of less than 15 mm²***”) was not disclosed or suggested in Josse et al. Treating an unsupported conclusion as fact does not magically create support. The fact remains the Examiner has a burden (showing where in Josse et al. each and every claim limitation is disclosed or suggested, as provided in MPEP§2142) that remains unsatisfied. The only conclusion that can be drawn is that no *prima facie* case for obviousness can be made.

If somehow the Examiner’s unsupported conclusions rise to the level of *prima facie* obviousness, applicants have sustained their burden of presenting evidence in both the Example in the specification and in the Aastrup Declaration of showing surprising results (specification) and teaching away from (Aastrup Declaration). MPEP§2142 provides “If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness. If, however, the examiner does produce a *prima facie* case, the burden of coming forward with evidence or arguments shifts to the applicant who may submit additional evidence of nonobviousness, such as comparative test data showing that the claimed invention possesses improved properties not expected by the prior art. The initial evaluation of *prima facie* obviousness thus relieves both the examiner and applicant from evaluating evidence beyond the prior art and the evidence in the specification as filed until the art has been shown to render obvious the claimed invention.”

The Examiner now states that the Aastrup Declaration was “addressed.” The Aastrup Declaration was not supposed to be “addressed.” The Aastrup Declaration provided evidence of record showing how contemporaneous references teach away from the claimed invention, rebutting the Examiner’s unsupported conclusion of obviousness. Therefore, the Aastrup Declaration provides evidence into the record that needed to be and still needs to be “considered.” The Examiner repeats an earlier conclusion “The Aastrup declaration does not alter the basic facts and evidence presented by the Examiner.” That statement is one of many such statements by the

Examiner why this patent application needs to go to appeal or at least have someone familiar with the legal aspects of patent prosecution review the record herein. Again, the Aastrup Declaration provides evidence that must be considered BEFORE drawing a conclusion⁴. The Aastrup Declaration was not presented to “alter the basic facts and evidence presented by the Examiner.”⁵ The Examiner then provides a conclusory sentence worthy of a political campaign (“It is not surprising that the inventor (Aastrup) of the instant invention attempts to declare that his invention is non-obvious over the Prior Art.”). Did the Examiner even read or consider the Aastrup Declaration? Where did Dr. Aastrup provide such a conclusion? The only conclusion drawn by Dr Aastrup stated: “My conclusion from the disclosures of Lu et al. I, Lu et al. II and Wu et al. is that all three references suggest to increase the area or size of the electrodes in QCM for improving sensitivity and not make the electrodes smaller as we have done in our invention.” Therefore, Aastrup Declaration provided evidence in the form of three references that each teaches away from the claimed invention. Moreover, Dr. Aastrup signed his declaration with a standard statement providing for the truth of the facts (not conclusions) asserted therein. While the Examiner is asserting fact for his unsupported conclusions, applicants have not done the same thing. Applicants have provided copies of each of Lu et al. I, Lu et al. II and Wu et al. cited in the Aastrup Declaration.

The sentence spanning pages 5-6 of the Office Action seems to confuse the Examiner’s previous position or is an admission by the Examiner that he has indeed been using hindsight as the basis for his conclusion of obviousness. It appears that the Examiner is still erroneously equating a “motivation” to alter electrode size as the actual claimed invention. In this regard, the Examiner appears to be violating 35 U.S.C. §103(a) (“Patentability shall not be negated by the manner in which the invention was made.”). It is clear that the Examiner is focusing on the act of “modification” as being the actual invention whereas the claimed invention is defined by the claim limitations that say nothing about modification but instead claim the surprising results achieved.

⁴ MPEP §2142 provides: “When an applicant submits evidence, whether in the specification as originally filed or in reply to a rejection, the examiner must reconsider the patentability of the claimed invention. The decision on patentability must be made based upon consideration of all the evidence, including the evidence submitted by the examiner and the evidence submitted by the applicant.” It should be noted there has been no evidence submitted by the Examiner, only an ever-expanding “scientific theory” that lacks a date for determining if it was in the public domain (as the theory as a whole) and is prior art. Yet the Examiner has not produced a prior art reference that expounds and explains such a scientific theory.

⁵ For the record, it should be noted that the Examiner has not presented any “basic facts and evidence” but has instead drawn conclusions unsupported by the teachings of both Thompson et al. and Josse et al. The Examiner’s “scientific theory” the ever-evolving rationalization that grows with each successive Office Action, is not prior art and cannot be used to support a rejection. Moreover, the Examiner seems to now be treating his unsupported conclusions as facts and his assumptions, postulations and other speculations as “evidence.” It appears that evidence, in the form of the Aastrup Declaration, seem to be ignored for the “sin” of providing evidence that contradict the Examiner’s conclusions, and even worse, contradicts the Examiner’s “scientific theory.”

5. The Examiner has quoted one of his unsupported conclusions and then followed that sentence up with the remarkable assertion “This statement is factual and completely correct, and the Applicant has failed to provide convincing argument otherwise.” If that sentence does not raise enough red flags, two sentences later is another misstatement of the law (“Clearly, the Examiner is not required to find the specific dimensional values recited in the claims, but only required to provide a reasonable **motivation** for one of ordinary skill in the art at the time the invention was made to **modify** the Prior Art reference, which is to **alter** the total area of the electrode surface.” (emphasis added)). If the Examiner’s new standard for patentability is applied, there will be no patents issued. All one needs is a “motivation” to “modify” and then whatever one achieves is automatically obvious, irrespective of any required “reasonable” or even an unreasonable expectation of success or failure. The “motivation to modify” sentence shows that the Examiner is making up what is the claimed invention and only requiring a “motivation” to “modify” or “alter” something as enough support for a rejection. In other words, the Examiner now thinks “obvious to try” is enough irrespective of the reasonable expectation of success.

Yet again, the claimed invention is not a process or method for a “modification” or an “alteration” of the prior art. “Modification” or “alteration” can mean anything. Instead, the claimed invention is specifically a smaller surface area, a direction that was suggested in Thompson et al. would lead to poor results and is taught away in the three contemporaneous references provided in the Aastrup Declaration. Applicants have properly provided convincing evidence of both secondary considerations to support a teaching away from argument. The Examiner is required to consider such evidence before reaching a conclusion, not by treating an unsupported conclusion as fact.

If the Examiner is trying to assert that it was obvious to try (from Thompson et al.) by asserting that he is “only required to provide a reasonable **motivation** for one of ordinary skill in the art at the time the invention was made to **modify** the Prior Art reference, which is to **alter** the total area of the electrode surface” (emphasis added), then MPEP§2142 requires that the Examiner shows a reasonable expectation of success ((E)“Obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.”). No where has the Examiner shown a reasonable expectation of success. No where has the Examiner provided a reasonable expectation of success in light of the applicants evidence showing surprising results in the specification of showing other references clearly teach away from the claimed invention (“*having a continuous surface area of less than 15 mm²*”) in the Aastrup Declaration. Therefore, the list of MPEP-copied case law citations in item#5 are not relevant to the legal issue at hand, namely, where is the reasonable expectation of success, particularly in light of the evidence of record showing surprising results and teaching away from.

6. Item #6 makes no sense. The Examiner asserts that it is proper to combine references. Yet the two rejections presented under 35 U.S.C. §103 do not combine references. The only “element” added is the Examiner improperly trying to insert himself into the role of a person of ordinary skill in the art exercise, the ultimate in hindsight trying to rationalize the results provided in the specification as to how one *could* have postulated such a thing using the Sauerbrey equation. Is the Examiner now trying to assert that his “scientific theory” is prior art? If so, what is the publication date of this alleged prior art? Applicants are not here to engage in theory or academic debate. Instead, this prosecution must follow the rules set forth and expounded in the MPEP and require something other than an Examiner drawing conclusions without evidence. No such evidence has been provided. Applicants have provided evidence of surprising results and teaching away from. Even worse, the Examiner’s long-winded paragraph starting on page 7 and going to the top of page 9 of the Office Action never addresses the claimed invention.

The Examiner asserts in one long sentence (“As pointed out above, [1] even if the Applicant is correct in stating that the claimed TSM resonator has ***increased sensitivity (which the Examiner does not concede)*** [2] one of ordinary skill in the art at the time the invention was made would ***modify*** the size/area of the electrode, in particular, ***reduce the overall surface area of the electrode***, [3] one of ordinary skill in the art, ***could***, in fact, ***employ this motivation to reduce the size of the electrode to below 15 mm²***, or any other smaller area, [4] ***if less sensitivity is required in the application of the TSM device***, for example, in an environment where there is a heavy/high concentration of the analyte to be detected/sensed.”) (emphasis added and numbers inserted for discussion below). In clause #1 from the quoted sentence, how can the Examiner not concede the fact of increased sensitivity? Applicants have pointed out the comparative data in the specification (see example) numerous times showing increased sensitivity. Has the Examiner not read it? Is the Examiner not considering such data when it does not fit with his preconceived theories? This is why the evidence of surprising results must be considered BEFORE reaching a conclusion of obviousness. Clause #1 in the quoted sentence provides evidence of record herein that the Examiner is not doing his job of considering all of the evidence of record. In clause #2 from the quoted sentence, as has been asserted repeatedly, the claimed invention must be considered and the claimed invention is not a process for modifying electrode shape/size. The claimed invention has multiple limitations including this one (“***having a continuous surface area of less than 15 mm²***”), that is what the Examiner must finally consider. In clause #3 of the quoted sentence a person of ordinary skill in the art “*could*” employ “this motivation?” One “*could*” do anything. The fact remains that the claimed invention is not what one *could* do, it is the result of the surprising results achieved, or what the applicants *did* do. The specification provides results that one of ordinary skill in the art, who studied Thompson et al. *would* NOT be “motivated” to do because Thompson et al. teaches away from reducing the size of the electrode. Clause #3 is

unsupported because there is no suggestion in Thompson et al. to so motivate a person of ordinary skill in the art to **reduce the size** of an electrode. Lastly, clause #4 of the quoted sentence is rank speculation that is at odds with the instant specification. In Figure 8 and in the Example (page 18) (“The sensitivity in measuring the difference between PBS solution and de-ionized water of the small (4 mm²) electrode was thus much higher than the sensitivity of the standard (15,9 mm²) electrode, a sensitivity increase exceeding a factor of ten.”) the specification **directly contradicts** the Examiner’s rank speculation. This provides evidence in the record that the Examiner’s is elevating mere speculation and theory to conclusion while ignoring the evidence of record, including the actual data presented in the specification. Therefore, applicants respectfully urge the Examiner to follow the Rules and the MPEP in examining this patent application because the evidence of record clearly shows that the Examiner has “gone rogue” and is ignoring the MPEP.

7. In item #7, what is stunning and remarkable is that the Examiner has attempted to distinguish *Eisai v. Dr. Reddy’s* (full cite is *Eisai Co. Ltd. v. Dr. Reddy’s Laboratories, Ltd. and Teva Pharmaceuticals USA, Inc.*, Fed. Cir. 2008, July 2008) because the subject matter is chemical compounds and not within the academic discipline of physics. Therefore, the Examiner has now created a new standard for distinguishing case law, that is, the subject matter of the lawsuit must be in the same area or academic discipline as the invention at issue for the case law to be considered as appropriate. We shall call this the “Examiner’s Standard for Applicability” or ESA for short. Therefore, using the ESA, the *KSR* decision is not relevant for consideration to the present invention because *KSR* involved an electronic accelerator petal, something completely different from the alleged physics of electrode dimensions for “thickness shear mode piezoelectric resonator for use in a sensor arrangement for detecting or measuring an analyte in a medium by mass changes” as is provided in claim 1 herein. In fact, using the ESA, all of the Examiner’s citation must be thrown out as distinguished according to the ESA. Accordingly, item #7 provides further evidence that the Examiner has “gone rogue.”

8. In item #8, the Examiner admits that the “evidence” that the Examiner is required to provide comes not from the prior art cited, certainly not from the art cited in the Aastrup Declaration, but comes from some “scientific theory” that is not published or tested in any standard peer review process, does not consider the data provided in the specification, but is made up by the Examiner. Therefore, the Examiner has now admitted that the evidence supporting his rejection is completely made up without consideration for data or publications of others. Applicants respectfully request that this present prosecution finally leave the university seminar room and move to the USPTO where the standards outlined in the MPEP apply. Applicants are unable to argue against a “scientific theory” that ignores (a) scientific evidence of record herein,

(b) teaching away from in a prior art reference, (c) surprising results provided in the specification in the form of actual experimental data, (d) the teaching away from by others provided in the Aastrup Declaration, (e) legal precedent, and (f) treats unsupported conclusion as fact. Any of the foregoing six reasons provide a showing of why this prosecution has gone on for too long without following proper Rules, procedure or the MPEP. Accordingly, applicants implore PTO management to review this file in all of its detail because the Examiner has admitted he is not following any requirements for patent examination but is instead advancing his “scientific theory.”

If there is any doubt from the foregoing evidence that the Examiner has “gone rogue,” it should be erased in the final sentence of item #8 where the Examiner states “In the instant case, the Examiner has provided an *excellent and convincing line of reasoning* supporting the rejection based on the *coupling of knowledge* of one having ordinary skill in the art to *modify* the Josse et al. reference.”⁶ (emphasis added).

35 U.S.C. §103 Rejections

Claims 1-5 and 8-10 and 25-28 were rejected as unpatentable under 35 U.S.C. §103 over Thompson et al. (U.S. Patent Application 2003/0076743). The Examiner has repeated this rejection but has significantly added to the “scientific theory.” The Examiner again admits that Thompson et al. does not disclose or suggest the key limitation (“*having a continuous surface area of less than 15 mm²*”). The Examiner again misrepresents Thompson et al. suggesting a “modification of geometry of the electrode(s)” without noting that Thompson et al. teaches away from the invention by suggesting that making the electrodes smaller is negative for device sensitivity. The Examiner then goes into even more detail regarding his “scientific theory” as filling in with whatever Thompson et al. is missing. Applicants traverse this rejection because (1) Thompson et al. is misrepresented, (2) Thompson et al. teaches away from the claimed invention, and (3) the Examiner’s “scientific theory” (which the undersigned attorney does not understand) whatever it is, is not prior art.

1. Thompson et al. is misrepresented because the Examiner has quoted Thompson et al. in bold on page 4 of the Office Action showing that Thompson et al. states that “since reducing the electrode size of one of the electrodes causes instability in device resonance.” So how can the Examiner now ignore that passage 8-9 pages later in the same Office Action? Thompson et al. does not “disclose teachings in regards to the variation and modification of geometry of the electrode(s), in particular, their total surface area, as well as perimeter edge distances” as the Examiner alleges. Thompson et al. teaches drilling a hole in the electrode to add to edge areas, plain and simple. Therefore, the Examiner is trying to elevate the edge teachings of Thompson et

⁶ It should be noted that a reader of the Examiner’s argument would never know, up until this last sentence, that the Examiner was referring to Josse et al. at all.

al. into an entire geometry course. Accordingly, Thompson et al. has been misrepresented by the Examiner.

2. As has been addressed in previous responses by applicants, Thompson et al. teaches away from the claimed invention by suggesting that making the electrodes smaller “causes instability in device resonance.” No matter how much the Examiner wishes to try to dance around this fact, the Thompson et al. disclosure teaches away from the claimed invention as has been shown repeatedly and is of record herein.

3. As is discussed in the applicant’s response to the Examiner’s Response to Arguments above, the Examiner keeps digging a deeper and deeper hole going into more equations and speculation of pages 11-13 of the Office Action to continue to expound his “scientific theory.” Applicants have submitted the Aastrup Declaration showing what actual scientists of ordinary skill in the art *did do* to increase sensitivity. Scientists of ordinary skill in the art made the electrodes larger, not smaller. The Examiner only speculates but he cannot ignore the evidence submitted showing, not speculating, what scientists of ordinary skill in the art *did do* and not continue to speculate what one of ordinary skill in the art *would do*. Accordingly, the Examiner is respectfully requested to follow the First Rule of Holes, that is, when one has dug a deep hole, stop digging.

4. In the figure on top of page 14 of the Office Action, the Examiner has copied a figure from Thompson et al. then then altered it with the two passages “continuously drawn circle” and “continuously drawn line/diameter.” It should be noted that the present invention is not directed to a geometry lesson, an existential or metaphysical existence, regarding if life is “continuous” or “discontinuous.” The claimed invention refers to a “continuous electrode,” not a “continuous line” and not a “continuous circle.” Instead, the undersigned would use an eating analogy, something we all do. No one skilled in the art of eating bread would confuse a claimed English muffin (continuous bread) from a bagel (having a hole in it by design).

Withdrawal of this rejection is respectfully requested.

Second Rejection

Claims 1-5 and 8-10 and 25-28 were rejected as unpatentable under 35 U.S.C. §103 over Josse et al. (U.S. Patent 5,852,229). This rejection was based on the Examiner’s unsupported assertion that Josse et al. somewhere, somehow suggests that changing (but without indicating which way or how) electrode size will impact sensitivity. In the present Office Action, the Examiner again expounds at length on what Josse et al. is supposed to be suggesting but no where points to where Josse et al. actually suggests anything about “electrode surface area.”⁷ The Examiner again admits that Josse et al. does not disclose or suggest the limitation of claim 1 (“a

⁷ Conductivity of the loading medium is not related to surface area. Moreover, why does the Examiner fail to cite where this alleged relationship is found? Could it be made up?

continuous surface area of less than 15 mm²”), but instead somehow dances around this issue by stating: “Although Josse et al. does not disclose specific quantitative surface areas of the electrode(s), that is, specific dimensional/geometric aspects of the electrodes(s) (i.e. surface area <15 mm² or 10 mm² or is 1-5 mm² or the distances between the crystal edge and the electrode edge being at least 0.2 mm or 1 mm or 2 mm) (as recited in claims 1-3, 5 and 25-28), Josse et al. does carefully teach and explain that ‘conductivity of the loading medium results in the expansion of the effective electrode surface area, and that the electrode regions and their electrostatic capacitance is a result of the electrode size, shape and configuration, in other words, the electrode surface area.’”

The Examiner then needs to add “scientific theory”, covering more than a page, from pages 15-16 of the Office Action, to try to fill in with pure speculation what Josse et al. fails to disclose or even suggest. Therefore, applicants continue to traverse this rejection for the reasons provided in previous responses (such as (a) evidence in the Aastrup Declaration showing the failure of others and teaching away from the claimed invention, (b) the lack of a showing or *prima facie* obviousness, and (c) because the Examiner admits that Josse et al. fails to disclose or suggest the key limitation of electrode area and size) to now also include (d) the scientific theory expounded upon by the Examiner is mere speculation and not evidence, and (e) the scientific theory is not prior art.

(d) The Examiner makes a series of unsupported statements such as “variations in electrode sizes affect the resonant frequencies and anti-resonant frequencies.” So what? The undersigned attorney for applicants has no idea if that statement is correct or not. But that unsupported assertion is irrelevant to the issues of whether or not Josse et al. provides any teaching or suggestion of the claimed invention. Instead, the Examiner is urged to look at the specification. The first sentence of the “Description of the embodiments” section on page 6 summarizes the invention: “The present invention is based on the surprising finding that a smaller sensing electrode area leads to a largely increased sensitivity of a piezoelectric resonator.” Why does the Examiner need to speculate about what *might be* and try to imagine what Josse et al *might be* thinking but not stating? The Examiner needs to show disclosure, expressed disclosure, not rank speculation. Therefore, the “scientific theory” is rank speculation and not evidence that can be addressed in the record. The scientific theory cannot be used to support a rejection.

(e) The scientific theory has been created by the Examiner during the prosecution of this patent application. It has not been published or available to the public except in the file history of this patent application. Therefore, the scientific theory is not prior art to the present invention. Accordingly, no *prima facie case* of obviousness can be made because the scientific theory is not prior art.

In view of the facts and evidence of record herein, applicants respectfully request withdrawal of this rejection.

In view of the foregoing response to Examiner's Response to Arguments, remarks, Aastrup Declaration, and the entire file history, applicants respectfully request allowance of claims 1-5, 8-10 and 23-28.

Respectfully submitted,
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